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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/742,473

12/22/2000

Byung-Soo Ko

3430-0161P

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02/18/2004

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

NGO, HUYEN LE

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/742,473

Applicant(s)

KO, BYUNG-SOO

Examiner

Julie-Huyen L. Ngo

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Response to Amendment

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action mailed on June 4, 2003 is withdrawn.

However, claims 1, 3-7 and 9-12 have been amended in last Amendment (paper 6) received on 11/22/2002. Therefore, a new final action with a new reference of Jeong et al. (US6081308A) is applied as set forth below. The new reference discloses the taper angle greater than 45 degrees.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 7 to 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong et al. (US6081308A) in view of Kim et al. (US6188452B1).

With respect to claims 1, 4, 5, 7, 10 and 11, Jeong et al. teach (Figs. 26A and 33-34, fifth embodiment) a method of manufacturing an array substrate comprising:

- forming an electrode line (gate line 210) has a first metal layer (second layer 212/222 made of Mo-alloy: MoW according to Jeong) and second

metal layer (first layer 211/221 made of Al-alloy according to Jeong) of dual layer structured on a substrate using a wet etching technique (col. 9 line 66 to col. 10 line 5)

- forming an inorganic insulating layer (gate insulating layer 300) on an exposed surface of the substrate while covering the electrode line

wherein the end portion of the electrode line has a taper angle of more than 45°C from a top surface of the electrode lines (col. 10 lines 9-12, see Figures 33-34).

With respect to claims 3 and 9, Jeong et al. teach (col. 9 lines 60-65) forming an electrode line having first and second metal layers of a dual-layered structure, and a side portion of the first metal layer a first metal layer (second layer 212/222 according to Jeong) made of molybdenum alloy (MoW) is more etched than a side of portion of the second metal layer (first layer 211/221 according to Jeong) made of aluminum layer by simultaneously etching two metal layers.

With respect to claims 2 and 8, Jeong et al. fail to disclose a gate-insulating layer made of organic layer from one of benzocyclobutene, an acrylic-based insulating material or resin.

Kim et al. teach (col. 2 lines 44-67) forming a gate-insulating layer made of an organic layer from benzocyclobutene for providing stable TFT characteristics.

Therefore, it would have been obvious for one of ordinary skill in the art to form the gate-insulating layer as Kakuda et al. disclosed with an organic layer made of benzocyclobutene for providing stable TFT characteristics.

Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong et al. (US6081308A) in view of Kim et al. (US6188452B1) as applied to claims 1-5 and 7 to 11, and further in view of Kaneko et al (US6404473B1).

Kaneko teach (Figs. 9B-C, col. 9, line 56 - col. 10, line 23) manufacturing an array substrate comprising an electrode line having a three-layered structure by simultaneously etching an upper most metal layer (third metal layer) and lowermost metal layer (first metal layer), which sandwiches a middle conductive layer (second metal layer) and have a low corrosion potential, so that a side portion of the second metal layer protrudes beyond side portions of the first and third metal layers. Doing so would suppress the growth of hillock of the second metal layer from the end portion and reduce the processing step.

Therefore, it would have been obvious for one of ordinary skill in the art to form an electrode line on the substrate of Kakuda in view of Kim device with a first, second, and third metal layers of three-layered structure having a side portion of the second metal layer protrudes beyond side portions of the first and third metal layers, for the reason set forth above, as taught by Kaneko et al.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

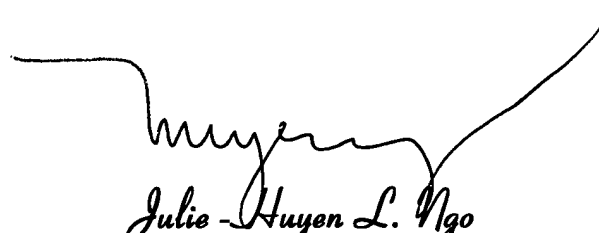
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (571) 272-2295. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (571) 272-2293.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1562.

Any facsimile-transmitted correspondence to this application should be faxed to the facsimile number (571) 273-2295. Please call before fax any paper over.

January 23, 2004



Julie-Huyen L. Ngo
Patent Examiner
Art Unit 2871